

# What's Wrong With My Tree!!!!

Adapted from articles by Dave Smitley, MSU Entomology Department

Calico scale is an *insect* infesting many trees in Michigan. Several Michigan counties have been hit hard this year by scale. While scale doesn't usually kill trees, it may weaken them making the trees susceptible to other environmental stresses. The 2009 outbreak of scale was a peak year, and we may experience the same size of outbreak in 2010. Scale populations grow and collapse in 5 to 10 year cycles driven by parasites and predators. Heavy populations sometimes persist for years, particularly where natural enemies are suppressed by insecticides. This insect can be spread from tree to tree by wind and birds

The first symptom noticed is usually honeydew rain and can be particularly annoying when branches of infested trees are over decks or parked cars. Honeydew is sugary liquid waste excreted by scale. A considerable amount of honeydew falls as scale must ingest large amounts of tree sap to get the proteins they need to grow and reproduce. The honeydew can turn black from sooty mold fungi growing on it. If the sooty mold is extensive, it may interfere with the trees ability to use sunlight for photosynthesis, thus weakening the tree. The mold is not dangerous to people or pets.

## Plants Attacked

Dogwood, redbud, crabapple, honeylocust, elm, magnolia, maple, sweetgum, tulip tree, oak, zelkova, pear, and many more.

## Insect Identification

This colorful white and dark brown calico scale is about 1/4 inch in diameter. It is brightest at maturity and darkens with age. The first-instar nymphs are pinkish in color becoming yellowish as they enlarge. Throughout the winter the immature females are oval, flattened, and light to dark brown with a hard waxy coating. The large dry dark brown "bumps" on the branches are earlier generations and are dead. There is only one generation annually.

## Life History

### Winter

In late winter/early spring they molt to the third instar stage. The nymphs feed heavily on tree sap and molt into the adult stage.

### Spring/Summer

In April, females continue to feed, and produce eggs, prior to turning brown and crusty. Honeydew is at its worst during this time. After egg hatch in late May, through early June, crawlers move to leaves and settle to feed for the summer months. Falling of honeydew generally stops during the crawler stage. Crawlers are tiny oval-shaped and flattened. They feed all summer and grow to a length of 2 -3 mm.

### Summer/Fall

The Crawlers move back to the woody tissue where they molt to the second instar, which is black and has a harder waxy coating.



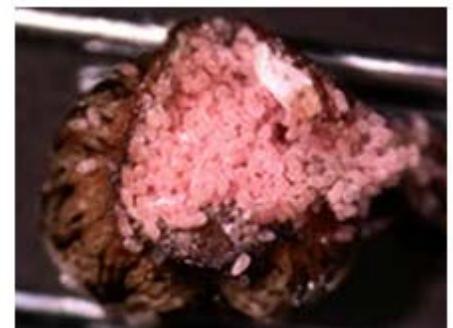
First Instar Calico Scale



Mature Calico Scale with twice stabbed ladybird beetle predator



Calico Scale adults



Calico Scale eggs

### **MSU Recommended Management Options:**

1. **Do nothing** and wait for the scales to be brought under control by natural enemies in the next two to three years.
2. **Spray infested trees** with insecticidal soap or 2% horticultural oil at peak crawler emergence (expected in early to mid-June). This gives some control & allows natural enemies to build.
3. **Spray infested trees** with a pyrethroid insecticide at peak crawler emergence. This gives you a higher level of control but will suppress natural enemies. Without natural enemies scale could come back even worse next season.
4. **Start soil drenches or soil injections** with imidacloprid for systemic scale control. Since imidacloprid takes six weeks to move into the tree from the soil, the best timing for soil drenches or soil injections is April. However, early June is not too late. Imidacloprid will suppress natural enemies but not as badly as spraying.
5. **Start trunk injections** with imidacloprid for systemic scale control. Trunk injections move imidacloprid into trees much faster, so late May or early June is a good time for them. Spring trunk injections of imidacloprid have not given very good control of the large female scales in May or early June, but they give excellent control of the next generation of crawlers and young scales that settle on the leaves in July and August. Injected chemicals will suppress natural enemies.

### **Troy's Management Options:**

1. **Inject the City trees** – Troy started injecting trees for scale in 2006 with little effect. It is estimated that Troy has over 120,000 trees planted in residential areas of which approximately 100,000 trees are or could become infested. To treat all 100,000 trees would cost over 7 million dollars annually. Additionally, injecting all City owned trees would not solve the problem. Privately owned trees with scale far outnumber City trees.
2. **Spray the City trees** – This approach is the most environmentally hazardous and damaging. Years ago Troy sprayed a biological product for gypsy moth. This product was specific to a particular type of caterpillar and posed no threat to the general public. There are no biological products for control of scale. The health of people living and working in Troy could be jeopardized with a mass application of sprayed chemicals.
3. **Do nothing** - MSU states that major scale infestations occur in 5 to 10 year cycles. We were all taught examples of biological cycles in high school biology. The most common example was the rabbit vs. coyote. In cycles, rabbit populations build to alarming numbers. In response the coyote population gradually builds up to a point that it can control the rabbit population. When the rabbit population crashed so do the coyote populations and the cycle starts all over again. Our rabbit (scale) population is at alarming numbers. The coyote population (in this case, parasites and predators) is slowly building and will eventually be able to bring the rabbit (scale) population down to acceptable levels. As with all insects, 100% control is never possible.

### **Troy's Management Plan:**

Injecting individual City trees gave some relief to a small number of Troy residents but did nothing for the majority of Troy's population. Additionally, past injections did not reduce the City wide scale population, while costing tens of thousands of tax dollars. Therefore, continuing the injection of City trees is not an efficient use of City tax dollars and will be discontinued. The City will continue to investigate and test alternative treatments but it is unlikely that a chemical solution will ever best natural controls.